## Ferry, Christopher

**From:** MORASH, MELANIE
**Sent:** Tuesday, February 18, 2020 7:54 AM
**To:** Cashwell, James M CERG
**Cc:** DiLorenzo, James; CEsakkiperumal; Andy Davis; Bowen, Libby T; Kerry R Tull; Peter H. Thompson; jbrunelle@nobis-group.com; jlambert@nobis-group.com; Walter, Nelson; Steve Humphrey; Kelly, Christopher; Jennings, Lynne; Ng, ManChak; Pechulis, Kevin; White, Sarah; Carroll, Courtney; garry waldeck; Janet Waldron; Brandon, William
**Subject:** Olin Chemical Superfund Site - Wilmington, MA - Data Gaps Work Plan - Phase IA Proposal - Seismic Work

Good morning, James,

I understand from Lynne that during a meeting between you and Lynne on February 10th you discussed dividing up further the Phase I activities proposed in the Data Gaps Work Plan. Specifically, you proposed a **Phase Ia effort of seismic work**, followed by a Phase Ib GeoProbe investigation.

Please provide a written summary of your proposal so that EPA can review and formally approve.

Thank you, and I look forward to speaking with you all later this morning.

Regards,

Melanie

---

Melanie Morash
Superfund Project Manager
EPA Region 1 – New England
5 Post Office Square
Boston, MA 02109
morash.melanie@epa.gov
(617) 918-1292

---

**From:** MORASH, MELANIE <morash.melanie@epa.gov>
**Sent:** Friday, January 31, 2020 4:08 PM
**To:** Cashwell, James M CERG <jmcashwell@olin.com>
**Cc:** DiLorenzo, James <dilorenzo.jim@epa.gov>; Brandon, William <Brandon.Bill@epa.gov>; CEsakkiperumal <CEsakkiperumal@olin.com>; Andy Davis <andy@geomega.com>; Bowen, Libby T <libby.bowen@woodplc.com>; Kerry R Tull <kerry.tull@woodplc.com>; Peter H. Thompson <peter.thompson@woodplc.com>; jbrunelle@nobis-group.com; jlambert@nobis-group.com; Walter, Nelson <nelson.walter@woodplc.com>; Steve Humphrey <shumphrey@geomega.com>; Kelly, Christopher <kelly.christopher@epa.gov>; Jennings, Lynne <Jennings.Lynne@epa.gov>; Ng, ManChak <Ng.ManChak@epa.gov>; Pechulis, Kevin <Pechulis.Kevin@epa.gov>; White, Sarah <White.Sarah@epa.gov>; Carroll, Courtney <Carroll.Courtney@epa.gov>; garry waldeck <Garry.Waldeck@state.ma.us>; Janet Waldron <Janet.Waldron@state.ma.us>
**Subject:** Olin Chemical Superfund Site - Wilmington, MA - EPA Comments - Data Gaps Work Plan - Phase I

Good afternoon, James,

Thank you for submitting the Data Gaps Work Plan, prepared by Geomega on behalf of Olin, and dated August 2, 2019 (Work Plan). The Work Plan presents a phased approach for data collection activities to close remaining data gaps at the Olin Chemical Superfund Site (Site).

EPA greatly appreciates Olin's efforts to reach technical consensus on key issues and acknowledges the significant work that has gone into producing a work plan product that reflects the evolving consensus. In general, the Work Plan captures the outcome of numerous technical discussions between the EPA and Olin teams.

EPA is generally in agreement with the phased, iterative approach as outlined in the Work Plan, specifically, that the general plan for subsequent efforts (Phase II, Phase III, etc.) will be based on an evaluation of the results of the Phase I activities. Note that EPA may determine that additional investigations that have not been anticipated in the Work Plan will be needed. For example, it may be necessary to drill into bedrock beneath the Plant B area, which is not currently included in the Phase I scope. Drilling into shallow bedrock and perhaps deeper bedrock may increase in importance depending on the results of the current phase of work.

EPA reserves the right to suggest additional and/or alternate sampling/survey locations based on a full review of surface geophysics, borings, and other data as it becomes available. Additionally, well replacement activities should be included in Phase II work for wells or sampling ports that have been compromised.

Finally, it must be acknowledged that the scale of the Main Street dense aqueous-phase liquid (DAPL) pool area is much larger than the Containment Area and Jewel Drive DAPL pool areas. The proposed seismic surveys will therefore result in a coarser "grid" and hence a lower level of resolution than that which will be obtained for the Containment Area and Jewel Drive areas. While it may be necessary to collect additional seismic data at a tighter line spacing in selected areas of the Main Street DAPL pool area as a follow-up, decisions in this regard can be deferred until the currently proposed data is collected, evaluated, and transmitted to EPA for discussion.

This e-mail specifically responds to the Phase I activities proposed in the Work Plan. These activities include the following: seismic reflection surveys to address bedrock surface data gaps; aerial electromagnetic (AEM) surveys in the Maple Meadow Brook (MMB) area to further characterize bedrock topography and groundwater; direct push soil and groundwater sampling in the northern portion of the Olin property and off-property groundwater areas to the north to address the extent and distribution of n-nitrosodimethylamine (NDMA) impacts; synoptic groundwater level collection; replacement of damaged well GW-26; and installation and monitoring of surface water gauges.

Two technical memos and a set of figures (dated December 17, 2019) are attached to this e-mail – one prepared by EPA's hydrogeologists, Bill Brandon and Christopher Kelly, dated January 31, 2020, and the other by EPA's technical support contractor, Nobis, dated August 22, 2019 (together, Comment Memos). EPA appreciates Olin's consideration of the Comment Memos, which need to be considered further before EPA can approve the initiation of the geophysical surveys. However, EPA will make every effort to expedite the review and approval of the Phase I Work Plan activities, once these additional comments have been reviewed and incorporated into the proposal.

In general, the majority of the geophysical alignments proposed for the Containment Area are acceptable. However, the Comment Memos (and accompanying figure) suggest a few modifications, in order to maximize overlap with existing boreholes. These adjustments to the alignments will serve to improve and constrain the seismic data as well as to validate previous estimations of bedrock from other methods, such as bedrock "refusal," or other estimations from drilling. Significant discrepancies, if any, will thus be highlighted.

In addition to the proposed modifications, several new seismic lines are proposed to increase resolution in key areas of the Site and to create a more regular grid spacing, which will contribute to a better result by increasing resolution and decreasing bias.

In particular, EPA believes that additional work, beyond that currently proposed in the Work Plan, is needed for the area north of the Olin property (GW-413 area). Specifically, EPA's emerging Conceptual Site Model (CSM) for the Site groundwater contaminant plume suggests that *steeply dipping fractures* are important and should be investigated as potential pathways in the bedrock, in addition to the *shallowly-dipping sheeting fractures* discussed in the Work Plan. EPA remains concerned that the NNW-striking plume shape, which also corresponds to the general direction of the groundwater head gradient, is influenced by NW-striking fractures that cross-cut the regional NE-SW fabric.

The current proposal in the Work Plan is weak in that it allows for very few locations for seismic data or follow-up confirmatory borings to interrogate the region where the *plume core* is likely to be based on Olin's CSM. It is therefore imperative that the Work Plan be augmented to allow for validation and delineation of the plume within and beyond the known limits of the current configuration.

While accepting elements of the Work Plan, EPA has added several seismic reflection lines and additional GeoProbe locations. The additional seismic lines are intended to resolve the position and shape of the top of bedrock and related features; the additional GeoProbe locations are needed to resolve groundwater concentration gradients in the high-concentration core areas as well as confirming the shape of the top of bedrock surface in the general plume region.

Regarding the final selections for additional deep monitoring, multi-port extraction wells and control points in the Containment Area, the EPA and Olin teams have come to the consensus that these will be deferred until the seismic data can be collected and integrated with the 2019 Containment Area drilling data. At that time, the teams will work together once the AEM and supplementary data are in hand, to determine the locations and depths for the next phase of borings and well installations.

Please provide a response-to-comment letter for the Comment Memos and a revised Work Plan, as appropriate, for EPA's review and approval, within 45 days of your receipt of this e-mail.

Regards,

Melanie Morash

---

Melanie Morash
Superfund Project Manager
EPA Region 1 – New England
5 Post Office Square
Boston, MA 02109
morash.melanie@epa.gov
(617) 918-1292

---

**From:** Steven Humphrey <shumphrey@geomega.com>
**Sent:** Friday, August 2, 2019 5:47 PM
**To:** Jennings, Lynne <Jennings.Lynne@epa.gov>; MORASH, MELANIE <morash.melanie@epa.gov>; garry waldeck <Garry.Waldeck@state.ma.us>
**Cc:** DiLorenzo, James <dilorenzo.jim@epa.gov>; Brandon, William <Brandon.Bill@epa.gov>; James M CERG Cashwell <JMCashwell@olin.com>; CEsakkiperumal <CEsakkiperumal@olin.com>; Andy Davis <andy@geomega.com>; Libby T Bowen <libby.bowen@woodplc.com>; Kerry R Tull <kerry.tull@woodplc.com>; Peter H. Thompson <peter.thompson@woodplc.com>; jbrunelle@nobis-group.com; jlambert@nobis-group.com
**Subject:** Data Gaps Work Plan

Greetings Lynne and team,

On behalf of Olin, please use the link to our ftp site to download the files for the Data Gaps Work Plan: combined text/tables/figures/appendices (Data Gaps Work Plan 8-2-2019.pdf), word and excel files for the text and tables are also included.Please do not hesitate to contact me with questions.

http://ftp.geomega.com/
username: olin
password: olin*123

Regards,

***Steven L. Humphrey PG***
Hydrogeologist/Groundwater Modeler

***Geomega, Inc.***
2825 Central Ave., Suite 200
Boulder, CO USA 80301
phone**:** 303.443.9117
cell: 303.579.8970
direct**:** 720.266.5405
email**:** shumphrey@geomega.com
fax**:** 303.938.8123